

THE PRESUMABLE IDENTITY OF CHEILANTHES
LANOSA

M. L. FERNALD

In 1803 Michaux, Fl. Bor.-Am. ii. 270 (1803), described from the mountains of Tennessee and North Carolina his *Nephrodium lanosum*:

LANOSUM. N. parvulum; elegans; totum lanosissimum: fronde oblonga, bipinnatifida; pinnis distantibus; pinnulis pinnatifidis; lobulis subrotundo-ovalibus, integris: punctis demum contiguus.

OBS. Habitus quodammodo POLYP. fontani; paulo majus.

HAB. in montibus saxosis Tennassée et Carolinae septentrionalis.

Certainly Michaux's "totum lanosissimum" and his description of the frond and especially its pinnules are promptly matched by the extremely lanate fern of the mountains of North Carolina and Tennessee which was described thirty years later as *Cheilanthes tomentosa* Link, Hort. Berol. ii. 42 (1833), . . . "stipes tomentosus . . . , pinnae . . . infra dense tomentosae", which in his full description D. C. Eaton, Ferns N. Am. i. 346, 347, rendered, "stalks . . . covered with . . . soft woolly hairs . . . The fronds . . . of a grayish color from the abundance of fine entangled tomentum." Are not these descriptions very close to Michaux's "totum lanosissimum"?

Michaux saw in his *Nephrodium lanosum* the habit of *Polypodium fontanum* of Europe, i. e. *Asplenium fontanum* (L.) Bernh., but the new American species was "a little larger". Hegi describes *Asplenium fontanum* as "Bis 25 cm hoch", i. e. 10 inches. Eaton, l. c., says of *C. tomentosa*: "The fronds vary from a few inches to over a foot in length".

On the mountains of North Carolina and Tennessee there is another species of *Cheilanthes*, which was described only one year after *Nephrodium lanosum* of Michaux. This is *Adiantum vestitum* of Sprengel, Anleitung, iii. 122 (1804).

Adiantum vestitum nenne ich eine Art, die Bosc d'Antic in Karolina fand. Sie hat einen dreyfach gefiederten Wedel, der über und über mit feinen woltichten Haaren bedeckt ist. Die Blättchen

der ersten und zweyten Ordnung sind ey-lanzetförmig; die der letzten Ordnung sind linienförmig, gekerbt und schlagen sich um die Saamenhäufchen zurück. Bosc nannte dies Farrenkraut *Acrostichum hispidum*.

Adiantum vestitum Spreng. (1804) from Carolina soon became *Cheilanthes vestita* (Spreng.) Swartz, Syn. Fil. 128 (1806) and under this name it was generally recognized in practically all works up to and through the 6th edition of Gray's Manual (1890), the *Pteridophyta* by D. C. Eaton, there (p. 681) properly described as "hirsute" and with the same characteristic illustration (pl. xvii) as had appeared in earlier editions, although these treatments may have had other species mixed with *C. vestita*. That *Cheilanthes vestita* and *C. tomentosa* are wholly distinct species no one questions; but that *C. vestita* is at all the plant clearly described as *Nephrodium lanosum* Michx., "totum lanosissimum", I can not believe. Neither did the earliest students of the group, who had the Michaux material before them. Thus, in 1804, Poiret, writing at Paris with Michaux's herbarium at hand, gave a more detailed account of the Michaux plant in Lamarck's Encyclopédie, v. 538 (1804), as *Polypodium lanosum*, although Poiret, with true French courtesy, ascribed *P. lanosum* to Michaux, a natural enough treatment since at the beginning of his long treatment of *Nephrodium* Michaux had entered "POLYPODIUM. L.". It is not necessary here to repeat Poiret's transcription of the text of Michaux (already quoted); Poiret's own additions, based obviously on the material before him, were as follows:

105. POLYPODE laineux. *Polypodium lanosum*. Michaux.

Polypodium pumilum, lanuginosum, fronde bipinnatâ; foliolis oblongis; pinnulis linearibus, lobatis, obtusis; stipite subcylindrico, ruffo. (N.)

.....

C'est une plant peu élevée, d'un port agréable, lanugineuse sur toutes ses parties, dont les pétioles sont droits, roides, d'un brun foncé, cylindrique; un peu comprimés, garnis de folioles alternes, distantes les unes des autres, munies de pinnules opposées, presque pinnatifides, fort petites, linéaires, divisées en lobes ovales, arrondis, très-entiers. La fructification consiste en petits points épars, très-rapprochés.

Cette plante croît sur les rochers pierreux de la Caroline & dans quelques autres endroits de l'Amérique septentrionale. (V. s. *Comm. Bosc.*) Elle a beaucoup de rapports avec le *polypodium fragrans*, Desfont.

It can hardly be affirmed that Poiret was describing something different and imagining characters not stated by Michaux, especially when the Michaux Herbarium was at his elbow. The facts that Swartz, *Syn. Fil.* 58 (1806), in transferring *Nephrodium lanosum* to *Aspidium* as *A. lanosum*, said "fronde tota lanosissima", while, on p. 128, in changing *Adiantum vestitum* Spreng. to *Cheilanthes vestita*, he said "frond . . . hispidulis", were corroborative, although they were somewhat literal transcripts of the original diagnoses. But, after many experiences with Michaux's species, my faith in the accuracy of André Michaux, his editor, L. C. Richard, and Poiret, who more fully described many of Michaux's plants, is so great that I place far more weight upon their descriptions than upon the confusions apparently made in the probably subsequent placing of loose labels upon the much-handled old specimens by a presumably non-botanical mounter.

A sheet in Michaux's Herbarium at Paris (a beautiful photograph taken by Mrs. Weatherby before me) contains 6 broken-off fronds which very clearly belong to *Cheilanthes vestita*, the plant with hispid or hirsute (not tomentose or lanate) fronds. This sheet has pasted on (presumably at a later date) the label of "HERB. MUS. PARIS" bearing at the bottom "Herbier de l'Amérique septentrionale d'ANDRÉ MICHAUX", and below that the label in the handwriting of André Michaux of *Polypodium lanosum*, with the "Hab. in excelsis montibus saxosis Tennessee et Carolina septentrionalis 2." The label is that of *Nephrodium lanosum*, Michaux having removed his genus *Nephrodium* from the inclusive *Polypodium* of Linnaeus subsequent to writing the label; but the sheet of 6 specimens to which it became attached is not at all of plants "totum lanosissimum". Whether in the Michaux Herbarium or in those of Lamarck or of Poiret there is a Michaux sheet with very lanate fronds is an academic question which may sometime be settled. Certainly the sheet of specimens with the labels does not contain the plants which Michaux (or L. C. Richard) and, afterward, Poiret described.

Such mixtures of labels, added to sheets which had apparently earlier been mounted, are occasional through the Michaux and other old Herbaria. In my own work with other groups I have sometimes noted them.¹ Since the sheet which now bears Michaux's label "*Polypodium lanosum*", etc. has 6 fronds, it is significant that when D. C. Eaton studied Michaux's material in 1866, he stated that there were "five medium-sized fronds" (D. C. Eaton in *Canadian Naturalist*, v. 26 (1870)). It is evident that Michaux's Herbarium has had more than a single sheet which has passed as *Nephrodium lanosum*. I can not subscribe to the argument that, when Michaux and then Poiret described a plant as "totum lanosissimum" they really meant one which is merely hispid and not at all lanate.

The first few species described from eastern North America of what is now the genus *Cheilanthes* were hopelessly misunderstood. These confusions were specially concentrated in the late 50's of the last century. Thus, in his *Species Filicum*, ii. 98 and 99 (1852), Hooker described as "*Cheilanthes 'vestita, Sw.'?*" (the interrogation indicating his doubt) and illustrated (his t. CVIII. B) a fern with "stipites . . . as well as the main rachis . . . laxly woolly, fronds . . . at the margins beneath and on the partial rachis, densely woolly the wool more or less tawny". As synonyms he gave (1) *Cheilanthes lanuginosa* Nutt. (an herbarium-name which was later, through Nuttall's material, identified with the western *C. Feei* Moore, based on *Myriopteris gracilis* Fée, not *Cheilanthes gracilis* Kaulf. (1824); (2) *Nephrodium lanosum* Michx. (1803), with the derived binomial *Aspidium lanosum* Sw., just as he had included the original *Adiantum vestitum* "Spreng. *Anleit.* iii. p. 122". The latter reference was quoted and the identity of the "densely woolly" "*Cheilanthes vestita*" was doubted by Hooker because he had not seen and seems rather to have doubted Swartz's correct description and Schkuhr's accurate illustration of it. Hooker said (p. 99): "What we here describe and figure as *Cheilanthes vestita* is . . . no doubt the *Nephrodium lanosum* of Michaux, *Fl. Bor. Am.* (1803), and he properly describes the fronds as 'lanosissimae'. Swartz, however, who adopts Sprengel's (prior?) specific name,

¹ For example see plate 1045 in *RHODORA*, xlviii, (1946) with the label over, instead of beneath the base of the leaf.

vestita, given in a work to which I have no immediate access, describes the fronds as *hispidulous*. Schkuhr adopts the same term, and figures a plant, the under side of which gives no idea of the really woolly nature of the frond; having, moreover, entire oblong pinnules, with a solitary terminal involucre". Michaux was correct in describing one plant, the lanate *C. lanosa* (Michx.) D. C. Eaton; Sprengel and Schkuhr were as vividly (even to the involucre as shown by Schkuhr) correct in describing another species, *C. vestita* (Spreng.) Swartz!

It is needless for one who is not a pteridologist and who is helpless in trying to understand all those who are, to follow all the subsequent confusions, but at least one other must be noted. This was D. C. Eaton's abbreviated and rather confused paragraph, without a word of description, in Torrey's *Botany of the Mexican Boundary*, 234 (1859), where the combination *Cheilanthes lanosa* was based on a doubted basonym, with at least two other synonyms involved, thus giving us the now supposedly sacrosanct combination which has been in vogue for half a century, *C. lanosa*, for a plant which is not lanate! Here is Eaton's paragraph:

CHEILANTHES LANOSA. *C. vestita*, Hook. l. c. p. 98, t. 108, B. *Nephrodium lanosum*, Michx. Fl. Bor.-Am. 2, p. 270? *Myriopteris gracilis*, Fée, l. c. p. 150, t. 29, f. 6. Along the Rio Grande; Wright. The name of *C. vestita* unquestionably belongs to the fern described and figured by Professor Gray under that name in the *Manual*, (2d. ed.) p. 592, t. 10.

Embarrassingly enough, the last item is the only one that was well founded. Eaton, although making the transfer, doubted the identity with the others of the Michaux plant; *Myriopteris gracilis* is by all students now considered a separate species, *Cheilanthes Feei* Moore, while the plant of Charles Wright, which inspired the paragraph, was later identified by Eaton, in his *Ferns of N. Am.* i. 41 (1878) as *C. lanuginosa* Nutt. (originally a synonym only of Hooker's confused *C. vestita*, but validated in 1863 by D. C. Eaton, although this was later than *C. Feei* Moore (1857) which, I am told, is the same species).

In his *Ferns of N. Am.* l. c. 13-15, Eaton got identities more straightened out, for he correctly took up the name *Cheilanthes vestita* for the plant with "fronds . . . hirsute . . . ; . . . the

ends of the roundish or oblong lobes reflexed, and forming separate herbaceous involucre". But he still kept in its synonymy the perpetually misinterpreted *Nephrodium lanosum* Michx. ("totum lanosissimum") with the first unequivocal name for it under *Cheilanthes*, "*Cheilanthes lanosa*, D. A. WATT, in *Journal of Botany*, February, 1874, p. 48: not of Moore, *Index Fil.*, p. 245, nor of Eaton, *Mex. Boundary Botany*, p. 234, which synonyms belong to *Ch. lanuginosa*, Nuttall". On page 15, arguing for the retention of "well known" names, he said "Michaux's name, *Nephrodium lanosum*, is undoubtedly the first published of the various names for this fern [*C. vestita*, with the characters as originally given by Sprengel and by Swartz] . . . Usually it is well to keep the oldest specific name when it is known; but . . . to endeavor to replace well-known specific names by older, but obscurer ones, is surely reprehensible".

I have been told that it is "reprehensible" to displace the name *Cheilanthes tomentosa* Link (1833) by *C. lanosa* (Michx.) D. C. Eaton (1859), based on *Nephrodium lanosum* Michx. (1803), for the former name is "established", while the name *C. lanosa* has (erroneously) "become established" for *C. vestita* which is not lanose! I can hardly subscribe to this philosophy, even though Michaux's label got affixed, probably after his death, to a sheet of specimens which lacks the characters given by him, and in more detail by Poiret, from the original and perhaps now lost lanate specimens. For quite as long a period, through the 6th edition of Gray's *Manual*, the name *C. vestita* was correctly used for the hirtellous species. When it was "reprehensibly" displaced, through error, by the name *C. lanosa* established usage of that period was certainly (and unjustifiably) upset. It seems to me that the name CHEILANTHES LANOSA (Michx.) D. C. Eaton (1859), based nomenclaturally on *Nephrodium lanosum* Michx. (1803), should replace *C. tomentosa* Link (1833), if the original descriptions mean anything.